

Meloe (Meloe) wrzecionkoi sp. nov. (Coleoptera: Meloidae) from Hungary

Boris BUBENÍK

I. J. Pešiny 2572, CZ-73801 Frýdek-Místek, Silesia, Czech Republic
e-mail: b.bubenik@krevnicentrum.cz

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Abstract. *Meloe (Meloe) wrzecionkoi* sp. nov. is described as new to science from the area of south-eastern Hungary, in the county of Békés, Gyula. The new species is compared to relevant species of the subgenus *Meloe* Linnaeus, 1758, especially with probably the most morphologically similar species *M. (M.) bodemeyeri* Ganglbauer, 1900. Illustrations of the habitus and diagnostic characters of *M. (M.) wrzecionkoi* sp. nov. and similar species. Habitat of the new species is discussed and presented in colour photographs.

INTRODUCTION

A biodiversity survey of the genus *Meloe* Linnaeus, 1758, in the county of Békés, within ten kilometers of the centre of Gyula (46°38'38"N 21°16'21"E), was carried out in 2022 and subsequently in 2023 by members of the International Entomological Association - Nature Conservation (Czech Republic). In addition to the records of *Meloegonius cicatricosus* (Leach, 1815) and *Lampromeloe variegatus* (Donovan, 1793), a new species of *Meloe* subgenus *Meloe* was found, differing from *M. (M.) proscarabaeus proscarabaeus* Linnaeus, 1758 and *M. (M.) violaceus* Marsham, 1802, which, moreover, were not recorded from the vicinity of Gyula (extensive material of *M. (M.) p. proscarabaeus* and *M. (M.) violaceus* from AWHS and BBFM was studied).

The description of the new species is based on a comparison with *M. (M.) bodemeyeri* Ganglbauer, 1900, whose general habitus and genitalia of the males are morphologically very similar but differ significantly in diagnostic characters (Figs. 4c, d, 6, 7c, 8, 11). Moreover, the distribution range of *M. (M.) wrzecionkoi* sp. nov. is considerably distant from that of *M. (M.) bodemeyeri* whose two localities are Eskişehir-Dorylaeum ("Dorylaion"), alt. 810 m (see Bodemeyer 1900: 30) and Bilecik, Karasu stream valley ("Biledjik...Karassuthal"), alt. 350 m (see Bodemeyer 1900: 23). *Meloe (M.) wrzecionkoi* sp. nov. is found at an altitude of 85 m. and is restricted to isolated grassy embankments in flatland, constructed as flood barriers in the vicinity of Gyula (Figs. 1-3). The survey on the Romanian territory was not carried out by us. Unfortunately, after more than 100 years the occurrence of *M. bodemeyeri* has been reduced due to urbanization and some of its original habitats have been lost (compare the appearance of the landscape according to Bodemeyer (1900: 25-26) and e.g. Google Maps <https://www.google.com/maps/place/Eskişehir>).

Detailed study and genitalization have confirmed that this new species differs significantly not only from *M. (M.) p. proscarabaeus* and *M. (M.) violaceus*, but also from *M. (M.) p. exaratus* Faldermann, 1832 (Fig. 12) (22 ♂♂ and 16 ♀♀ (AWHS, BBFM) from Armenia,

China (Gansu), Georgia, Iran, Israel, Kazakhstan, Syria, Turkey and Uzbekistan was studied) and *M. (M.) p. cyanellus* Brullé, 1832 (Figs. 7b and 10) (9 ♂♂ and 11 ♀♀ (AWHS, BBFM) from Albania, Bulgaria, Croatia, Greece, Hungary and Serbia was studied).

Comparison of other species of the subgenus *Meloe* has revealed the greatest similarity to *Meloe (M.) bodemeyeri*, described from Eskişehir in north-western Turkey. Seven specimens of *M. (M.) bodemeyeri* were therefore analysed, 1 ♂ (BBFM) and 1 ♀ (NMPC) caught by W. E. L. Bodo von Bodemeyer in the type locality Eskişehir in the late April 1911 (see Bodemeyer 1927: 32-39) and 1 ♂ (NMPC) labelled “v. Bodemeyer Anatolia Asia minor”. Another 4 specimens were caught in the western Turkey: Buldan, Süleymanlı lake, alt. 1100 m, 25.vi.2005 (1 ♀, AWHS); Eğirdir env., vi.2009 (1 ♀, BBFM); Gerede env., Bolu vil., 7.vi.2002 (1 ♂, AWHS) and Ödemis, Bozdağ mts, alt. 1100 m, 11.vi.1983 (1 ♂, AWHS).

MATERIAL AND METHODS

The nomenclature is according to Sánchez-Vialas et al. (2021), the taxonomy was used according the morphological revision of the Palearctic species of the *Meloe* subgenus *Meloe* by Pan & Bologna (2021).

Colour photographs of the habitus and diagnostic characters were taken with a Canon R digital camera (Mitutoyo 10x lens) and a Nikon D850 digital camera (Microobjective 90 mm lens), both using Adobe Photoshop & Helicon Focus (see the author of the macrophotographs in “Acknowledgements” below). Photographs of the type locality (Fig. 1) and live imagoes (Figs. 2 and 3) were taken with an Olympus Tough TG-6 camera.

Abbreviations for collections:

- AWHS Antonín Wrzecionko private collection, Horní Suchá, Silesia, Czech Republic;
BBFM Boris Bubeník private collection, Frýdek-Místek, Silesia, Czech Republic;
DKCP David Král collection, Praha, Czech Republic;
MABI Marco Alberto Bologna collection, Department of Sciences, University of Roma, Italy;
NMPC National Museum, Praha, Czech Republic.

DESCRIPTION

Meloe (Meloe) wrzecionkoi sp. nov.

(Figs. 1-3, 4a,b, 5, 7a, 9, 13)

Type locality. South-eastern Hungary, Békés county, Gyula (5 km E), altitude 85 m.

Type material. Holotype (♂) labelled: “24.IV/2022 - Hungary, Gyula, Békés alt. 85 m-Leg. B.Bubeník” [white label, printed]. Allotype and paratypes (16 ♂♂, 32 ♀♀): similar data as holotype but: III./2022 or IV./2023, leg. B. Bubeník or A.Wrzecionko or A. Márcus or other collectors. All types with red printed label: “HOLOTYPUS [ALLOTYPUS or PARATYPUS respectively] *Meloe wrzecionkoi* sp. nov. B. Bubenik det. 2023”.

Deposition of the types: The holotype in BBFM, allotype in AWHS. Paratypes: 1 pair in NMPC, 1 ♀ in MABI (III./2022, Gyula, alt. 85 m, leg. B. Bubeník), 5 ♂♂ and 2 ♀♀ in DKCP, the rest of the paratypes in AWHS and BBFM.

Description of a new species by differential diagnosis by comparison with *Meloe (Meloe) bodemeyeri*.

Body length (frons to posterior margin of elytra) of *Meloe (Meloe) wrzecionkoi* sp. nov.: Males 13-14 mm (holotype 13 mm), females 14-20 mm. Maximum width: Males 5-7 mm (holotype 6 mm), females 8-12 mm; males with predominantly black surface, some specimens with a bluish tinge; females slightly darker. Body size of *M. (M.) bodemeyeri* is similar to *M. (M.) wrzecionkoi* sp. nov. body size.

The head of *M. (M.) wrzecionkoi* sp. nov. (Fig. 5a) is almost of the same width up to the beginning of the labrum as that in *M. (M.) bodemeyeri* (Fig. 6); the head surface in both species is covered with punctures or foveae with smooth intervals (lacking raised margins around the foveae).

The labrum of the new species markedly differs in shape from that in *M. (M.) bodemeyeri* as clearly obvious in Figs. 5a, 6.

Antennae of both *M. (M.) wrzecionkoi* sp. nov. and *M. (M.) bodemeyeri*: males have the middle three antennomeres strongly widened, flattened and curved. In *M. (M.) bodemeyeri* the median antennomeres are always distinctly dilated, which has not been observed or described by some authors. Antennae in females of both species are filiform, with only weak median dilatation. The differences are evident in the images (Fig. 7).

Pronotum. The pronotal disc in *M. (M.) wrzecionkoi* sp. nov. is more distinctly rounded anteriorly, shorter and with flatter surface. In some observed specimens it gives the impression of sphericity (Fig. 5b, c), while the disc in *M. (M.) bodemeyeri* is anteriorly less rounded and generally longer, its surface is flat (Fig. 8), very similar to *M. (M.) wrzecionkoi* sp. nov.

Elytra (Fig. 4). The elytral surface sculpture in *M. (M.) wrzecionkoi* sp. nov. is sharper on the lateral margins, giving a duller surface appearance. The elytra in *M. (M.) bodemeyeri* are very similar, possessing almost the same character as in *M. (M.) wrzecionkoi* sp. nov., yet with an indistinctly deeper elytral sculpture.

Abdomen. Dorsally visible tergites in *M. (M.) wrzecionkoi* sp. nov. predominantly black, with a tinge of black-blue in some specimens; ventrites dark green, predominantly in females; each of the transverse ventrites possesses longitudinal impressions up to 1 mm long around the entire circumference of all ventrites. This character is very conspicuous and is absent in *M. (M.) bodemeyeri*, which has only a narrow thin band.

Legs as in Fig. 4, tarsi in males thinner and shorter than those of males, depending on the size of the specimens.

Male genitalia. Aedeagus variability in *M. (M.) wrzecionkoi* sp. nov. (Figs. 9 and 13): An endophallic hook is located on the upper movable part of the median lobe. This shows some variability, unlike *M. (M.) bodemeyeri* (Fig. 11), as it moves slightly further from the front of the rounded margin, and the entire hook shrinks slightly from its maximum size, and in one aedeagus it is completely absent. This study was conducted in twelve males. The remaining parts of the aedeagus remain the same in all specimens studied, independent of the size of the males.

Comments. Differences between *M. (M.) wrzecionkoi* sp. nov. and *M. (M.) p. cyanellus*:

The main distinguishing characters are in the shape of aedeagi (Figs. 9 and 10c,d). Females in *M. (M.) wrzecionkoi* sp. nov. have narrow and shorter legs and tarsi in proportion to the size of each specimen, unlike females in *M. (M.) p. cyanellus*.

The head in *M. (M.) wrzecionkoi* sp. nov. is almost uniformly wide up to the beginning of the labrum (Fig. 5), unlike in *M. (M.) p. cyanellus* where the head tapers to a slight cone (Fig. 10a). The pronotum in *M. (M.) wrzecionkoi* sp. nov. is more rounded anteriorly (Fig. 5b,c), while *M. (M.) p. cyanellus* usually has a narrower and longer pronotum with less rounded anterior margin; punctures and foveae on the pronotum are larger and deeper, forming raised margins around the foveae (Fig. 10), which are absent on smooth intervals around the foveae in *M. (M.) wrzecionkoi* sp. nov. (Fig. 5b,c).

Differences between *M. (M.) bodemeyeri* and *M. (M.) p. exaratus*:

The main distinguishing characters are in the male aedeagi (Figs. 11 and 12c,d); otherwise, these two species are externally very similar and live in western Turkey in habitats they share.

According to Ganglbauer (1900: 160) *M. (M.) bodemeyeri* is very closely related to *M. (M.) proscarabaeus* due to the extremely dense and wrinkled punctures on the head and pronotum in *M. (M.) proscarabaeus* and also because of the much finer pits on the head and pronotum and the fine, extremely dense longitudinal wrinkling on the elytra, etc. This present study confirms the opinion of Ganglbauer (1900). The difference in the antennae is highly conspicuous, especially in the males (Fig. 7). *Meloe (M.) p. exaratus* has raised formations around the punctures and foveae on the head and pronotum margins. These characters are not present in *M. (M.) bodemeyeri*. The elytra structure in *M. (M.) p. exaratus* has deeper impressions and rounded edges. This makes the surface of the elytra appearing shinier. In *M. (M.) bodemeyeri* the structure is finer and duller.

Red spots were observed on the basal tarsomere of posterior tarsi in these two revised specimens of *M. (M.) bodemeyeri*: In ♂ from NMPC and ♀ from Buldan (AWHS).

Bodemeyer (1900: 121) described the occurrence of 13 species of “*Meloe*” in western Turkey: *Eurymeloe (Bolognaia) murinus* (Brandt & Erichson, 1832), *E. (B.) rugosus* (Marshall, 1802), *E. (Coelomeloe) tuccia* (Rossi, 1792), *E. (Eurymeloe) escherichi* (Reitter, 1889), *Lampromeloe variegatus* (Donovan, 1793), *Lasiomeloe olivieri* (Chevrolat, 1833), *Listromeloe hungarus* (Schrank von Paula, 1776), *Meloe (Meloe) bodemeyeri* Ganglbauer, 1900, *M. (M.) proscarabaeus* Linnaeus, 1758, *M. (M.) violaceus* Marshall, 1802, *Meloegonius cicatricosus* (Leach, 1815), *Micromeloe uralensis* (Pallas, 1773) and *Taphromeloe erythrocnemus* (Pallas, 1782).

Name derivation. The new species is named in honour of Antonín Wrzecionko, Horní Suchá, Silesia, Czech Republic, one of the collectors of the new species.

Distribution. Until today the new species has been known only from the type locality in the south-eastern Hungary (Békés county), in the vicinity of the town of Gyula.



Fig. 1a-b. South-eastern Hungary, Békés county, around Gyula, the type locality of *Meloe* (*Meloe*) *wrzecionkoi* sp. nov.



Fig. 2a-b. *Meloe (Meloe) wrzecionkoi* sp. nov., holotype, live imago.

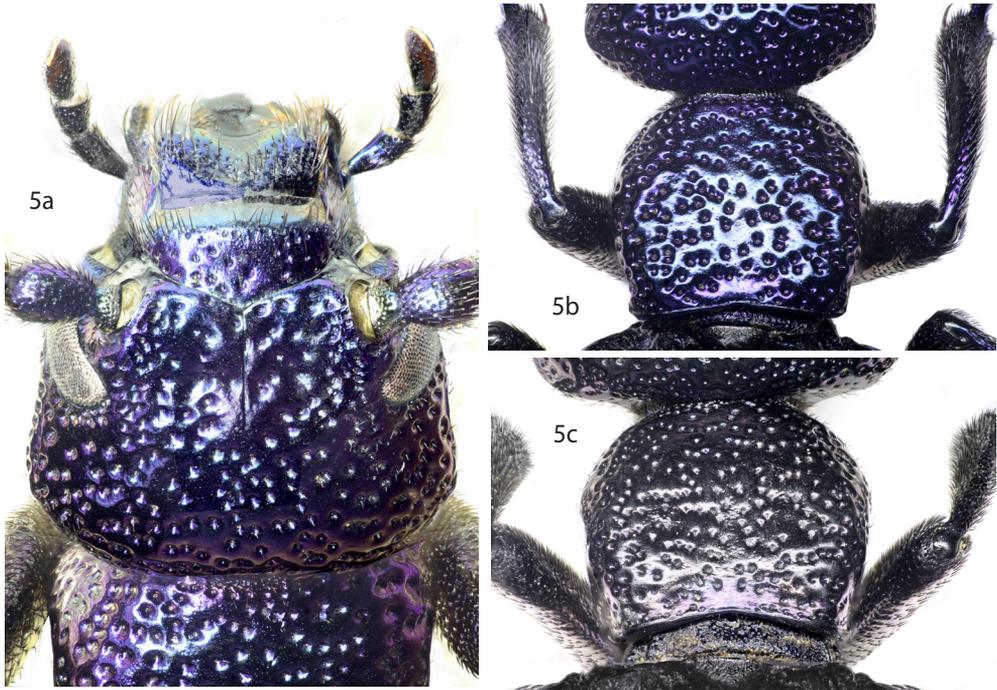


Fig. 3a-b. *Meloe (Meloe) wrzecionkoi* sp. nov., female, live imago from the type locality.

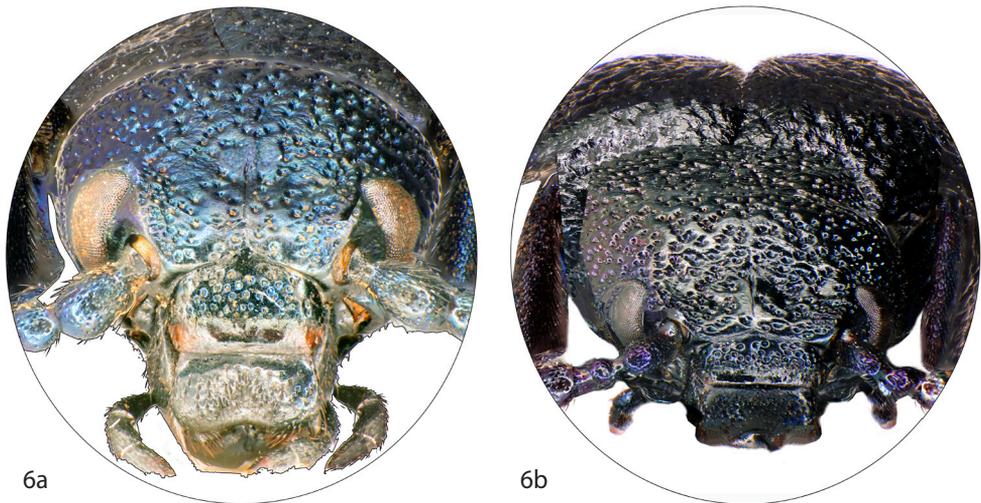


Figs. 4a-d. Habitus: *Meloe* (*Meloe*) *wrzecionkoi* sp. nov. holotype ♂ (Fig. 4a) and paratype ♀ (Fig. 4b) from the type locality. *Meloe* (*M.*) *bodemeyeri* Ganglbauer, 1900 ♂ (Fig. 4c) from "Anatolia" (NMPC) and ♀ (Fig. 4d) from Eskişehir (NMPC).





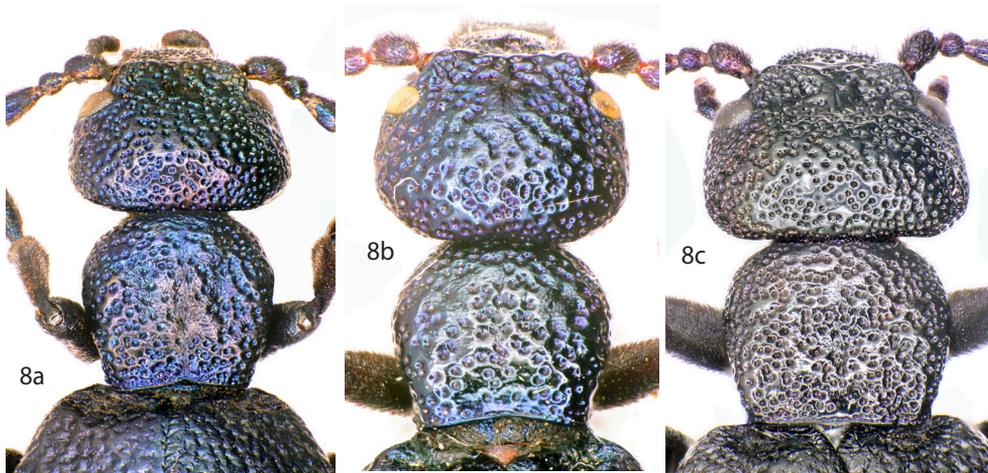
Figs. 5a-c. *Meloe (Meloe) wrzecionkoi* sp. nov., detailed view of the labrum (Fig. 5a), head and pronotum of holotype ♂ (Fig. 5b) and paratype ♀ (Fig. 5c) from the type locality.



Figs. 6a-b. *Meloe (Meloe) bodemeyeri* Ganglbauer, 1900, frontal view of labrum and head: ♂ (Fig. 6a) from „Anatolia“ (NMPC) and ♀ (Fig. 6b) from Eskişehir (NMPC).



Figs. 7a-c. Antennae. Fig. 7a. *Meloe (Meloe) wrzecionkoi* sp. nov., holotype (anterior and lateral views). Fig. 7b. *Meloe (M.) proscarabaeus cyanellus* Faldermann, 1832, ♂ from Bulgaria, Radomir, 22.iv.1985 (AWHS) (anterior and lateral views). Fig. 7c. *Meloe (M.) bodemeyeri* Ganglbauer 1900 ♂ (left) from “Anatolia” (NMPC) and ♀ (right) from Eskişehir (NMPC) (lateral views).



Figs. 8a-c. *Meloe (Meloe) bodemeyeri* Ganglbauer, 1900, detailed view of head and pronotum: ♂ (Fig. 8a) from “Anatolia” (NMPC), ♂ (Fig. 8b) from Ödemiş (AWHS) and ♀ (Fig. 8c) from Eskişehir (NMPC).



9a

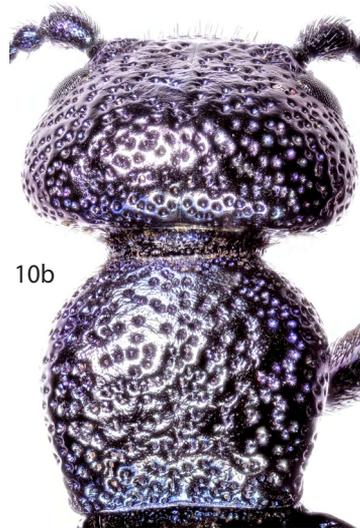


9b

Figs. 9a-b. *Meloe (Meloe) wrzecionkoi* sp. nov., aedeagus: Holotype ♂, dorsal view (Fig. 9a) and lateral view (Fig. 9b).



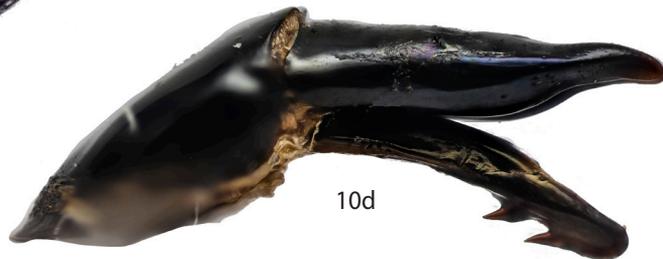
10a



10b



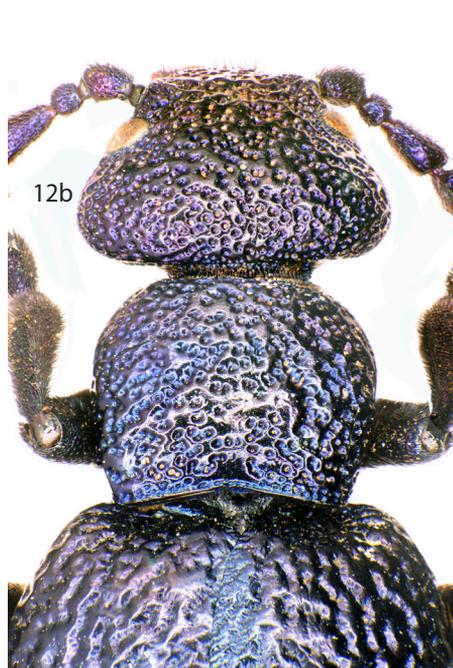
10c



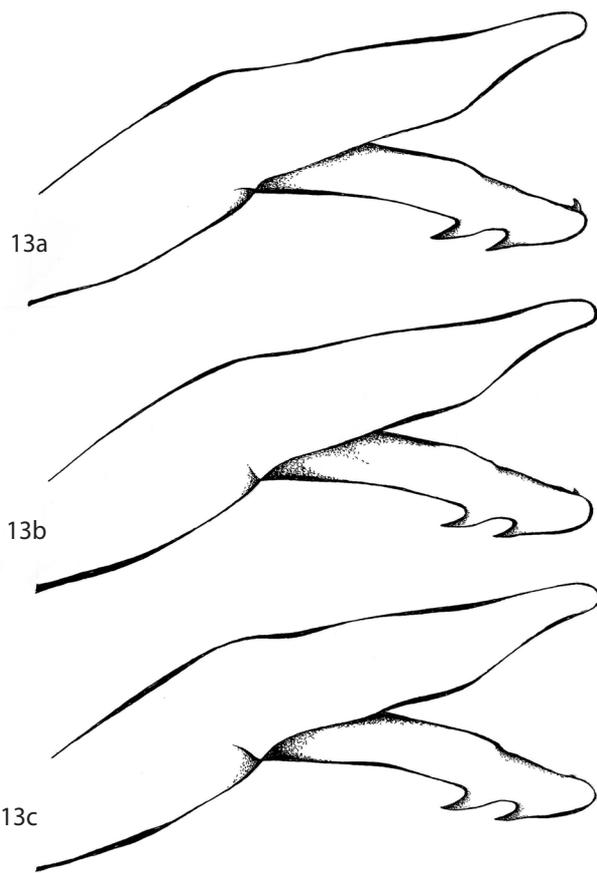
10d

Figs. 10a-d. *Meloe (Meloe) proscarabaeus cyanellus* Brullé, 1832, ♂ from Bulgaria, Radomir, 22.iv.1985 (AWHS), details of head (Fig. 10a), tegmen (dorsal view) (Fig. 10c), aedeagus (lateral view) (Fig. 10d); detailed view of head and pronotum of ♀ (Fig. 10b) from south-eastern Hungaria, Ópusztaszer, 26.iv.2023 (DKCP) (photograph by D. Král).

Figs. 11a-b. *Meloe (Meloe) bodemeyeri* Ganglbauer, 1900, aedeagus ♂ from "Anatolia" (NMPC), dorsal view (Fig. 11a) and lateral view (Fig. 11b).



Figs. 12a-d. *Meloe (Meloe) proscarabaeus exaratus* Faldermann, 1832, ♂ from eastern Turkey, Bingöl vil., Kuruca Geçidi (pass), alt. 1800 m, 31.v.1992 (AWHS), habitus (Fig. 12a), detailed view of head and pronotum (Fig. 12b), aedeagus, dorsal view (Fig. 12c) and lateral view (Fig. 12d).



Figs. 13a-c. *Meloe (Meloe) wrzecionkoi* sp. nov., aedeagus, variability of the endophallic hook of the median lobe, lateral views. (A. Wrzecionko drawing).

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